

DOE ASCI: HPC Resources at SDSC:

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NATIONAL PARTNERSHIP FOR ADVANCED COMPUTATIONAL INFRASTRUCTURE

SAN DIEGO SUPERCOMPUTER CENTER



Powerful, Adaptable High-End Capabilities on Blue Horizon

- Flexible machine usage through SDSC Catalina scheduler
 - Entire machine can be reserved by any user for 36 hours
 - Week-long, quarter machine run for U of Chicago user
 - Max run time increased from 18 to 36 hours at ASCI request
- General Parallel File System (GPFS) increased to 15 Terabytes in May 2003 (~80 TB on DataStar)
- Significant development platform added in 2002
 - 52 processors for shared, interactive access for debugging and small test runs

Future Systems On Track to Meet ASCI Needs

- **IBM Power4 DataStar compatible with LLNL's next system**
- **Smooth transition from Blue Horizon to DataStar**

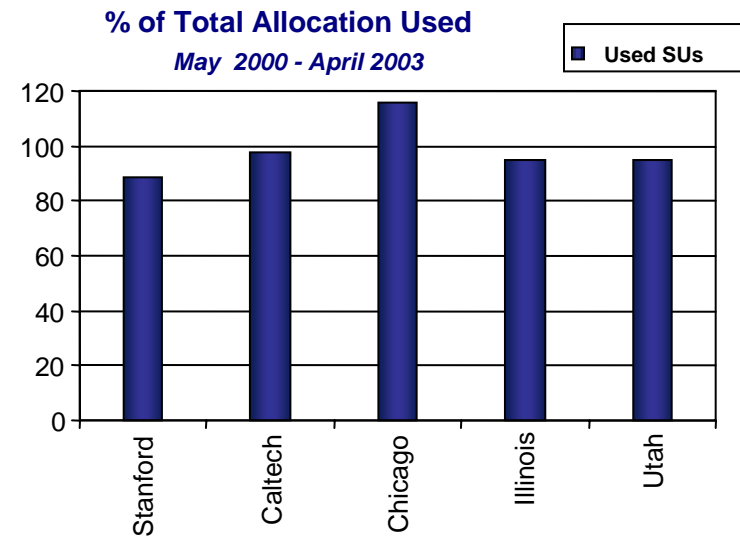
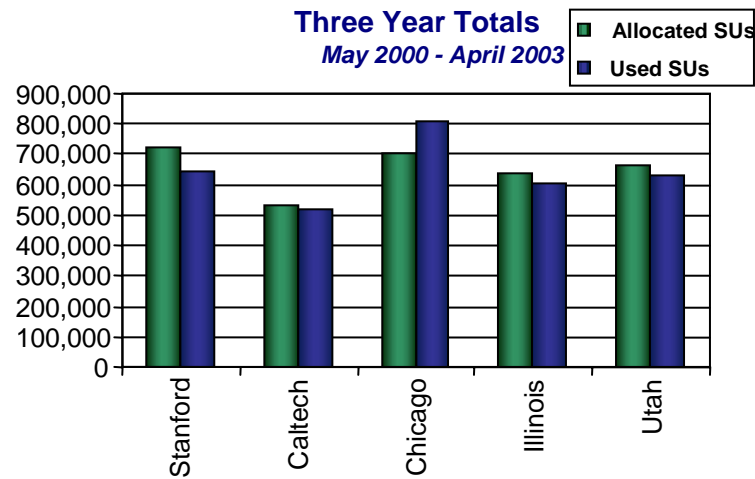


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High Usage Through Program History



Blue Horizon and DataStar

	Blue Horizon	DataStar
Processor	Power3-II 375MHz	Power4+ 1.7, 1.5GHz
Node type	8-way Nighthawks	32-way P690 & 8-way P655
Proc/nodes	1,152/144	1,024/128 & 256/8
Switch	Colony	Federation
Peak speed (TF)	1.7	7.9
Memory (TB)	0.6	3+ (128 16GB, 7 128GB, 1 256GB)
GPFS (TB)	15	100+

Status of DataStar

- **8 P690, 32-way, 1.7GHz nodes are on the floor**
- **10 TB disk attached to each node (80 TB total)**
- **No High Speed interconnect yet**
- **Expect 128 P655 nodes and Federation switch Nov/Dec this year**
- **P655 nodes and switch will be built simultaneously with ASCI Purple by IBM**

DataStar Orientation

- **1024 processors P655 nodes (1.5 GHz, identical to ASCI purple) will be available for compute intensive batch runs**
- **256 processors P690 nodes (1.7 GHz proc) with large shared memory (128 GB and 256 GB) will be available for pre/post processing and data-intensive apps**

DataStar Networking

- **Every DataStar node (136) will be connected by 2 Gbps Fibre Channel to the Storage Area Network**
- **All 8 P690 nodes are now connected by GbE**
- **Eventually (Feb 2004) most (5) P690 nodes will have 10 GbE**
- **All DataStar nodes will be on the Federation (2 GB/s) switch**

DataStar / ASCI Purple

- Highly **compatible**, with the DataStar compute intensive partition essentially identical to half of the ASCI purple initial delivery
- Expect simultaneous build and delivery
- Strong interactions between SDSC and LLNL, both directly and via the SPXXL and IBM SPSciComp organization and conferences
- SDSC plans a smooth transition from Blue Horizon to DataStar, **with overlap period**

Substantive Blue Gene/L Activities

- **SDSC participation with LLNL and IBM in the Blue Gene/L design and development**
- **Evaluation of application scaling to tens of thousands of processors for various design options**
- **Interested in getting a small Blue Gene/L as a companion to the large system at LLNL**